

DRAFT STRATEGY (version date January 11, 2006)

**Enabling Automated Electronic Supplemental Enforcement and or
Monitoring at North Carolina Intersections**



Intersection Safety Work Group

General Description

With the continued increase in travel and development along North Carolina's streets and highways, there are more vehicles traveling through an ever increasing number of intersections and driveways each year. Given that at-grade intersections present the traveling public with the maximum number of potential conflicts while at the same time bombarding the vehicle operators with all types of navigational decisions, signing, pavement markings, traffic control displays, advertising, and other visual and environmental noise, it is not surprising that intersection crashes make up approximately 49% (112,907) of all annually reported crashes in North Carolina and 34% (531) of NC's annual highway fatalities. While clearly the best solutions involve reducing the number of conflicts (typically through grade separation or restricted movements) other effective engineering countermeasures include geometric improvements, access management strategies, traffic control optimization and coordination, and improved advance guidance and decision support aides. Despite the best engineering efforts, the simple reality is

that the driver and the driving compartment environment is becoming even less aware due to in-vehicle distractions and lifestyle pressures that often conflict with the increasingly complex task of safely operating a motor vehicle through intersections. Recognizing the 4E (Engineering, Education, Enforcement & Emergency Response) System and the complex nature of the interaction between driver, vehicle, road, and environment one critical tool that is missing from North Carolina's Overall Safety Toolbox is the Automated Electronic Enforcement and Monitoring capability. Individual Municipalities have passed enabling legislation to allow the use of Red Light Enforcement Cameras at intersections within those municipalities, however there is no such enabling authority for the State to utilize these automated enforcement and safety monitoring tools at the thousands of intersections outside municipal limits or within municipalities that have not yet been able to sponsor and pass enabling legislation. If North Carolina is to seriously pursue the Strategic Life Saving Goals of significant and sustainable reductions in highway fatalities and injuries enabling automated enforcement and monitoring will have to be available as a life saving weapon in North Carolina's traffic safety arsenal.

Technical Attributes

Target	<p>Careless, Aggressive, and often distracted drivers who recurrently demonstrate a lack of respect and compliance for the “rules of the road.” The segment of the driving population is often referred to as the lunatic fringe in that these operators are frequently the same ones who fail to buckle up, who accumulate multiple citations, are involved in multiple incidents, follow too closely and frequently demonstrate aggressive risk taking. To restore the respect of a traffic control device that is often over-utilized (red is felt by many to not mean stop anymore – right on red, flashing red, etc.) and may often function in a less than traffic responsive manner (justification/appropriateness, phasing, timing, and coordination), the public will have to Less familiar, older drivers, and moderately distracted drivers who are navigating along a corridor with a specific destination or navigating via referencing crossing streets. Intent is to provide advance information that will help direct the motorist and re-assure the navigating motorist. Lane selection and maneuvers should take place in advance of an intersection thereby reducing vehicular conflicts and friction that often occurs when an operator fails to recognize they have reached their destination. The operator may then attempt a last second lane change or misses the turn entirely and then resorts to a more difficult legal or illegal recovery maneuver beyond the intersection. This strategy targets increasing safety for very experienced, distracted and less familiar drivers.</p>
Expected Effectiveness	<p>Provided that a thorough engineering and safety analysis is conducted and that other treatments have been attempted and determined to not be effective, and provided that the focus is on reducing injuries and the program is continually managed and evaluated , these installations would be expected to be extremely effective at supplementing enforcement, improving compliance, and most of all reducing fatalities and injuries.</p> <p>(Quote Forrest Council’s Figures 20 to 30K per year per intersection - conservative – note those figures likely largely based on programs that utilized a variety of approached for selection of locations to receive electronic enforcement)</p> <p>Crash Modification value would be expected to extend beyond treated locations as behaviors are incrementally improved/re-enforced.</p>
Keys to Success	<p>Use only after documented need based on engineering study and then only after other treatments have been tried and determined to not be effective at improving driver compliance, and improving safety.</p> <p>Must avoid the pitfalls of mis-representation of countermeasure as primarily a revenue generation tool or as an intrusive big brother device. All clearance intervals and design features would be required to be at the same high level as other NCDOT signalized intersections.</p> <p>Must Develop and Implement (includes delivery of training) STRONG State of the ART Practices for the appropriate managed use of electronic monitoring and enforcement tools.</p> <p>Continually recharge the public’s knowledge and appreciation for these life saving tools and emphasize the amount of law enforcement manpower that has been freed up to enforce crime prevention and respond to national security issues instead of continually responding to avoidable crashes and red light violations. Utilize expertise of GHSP with PI&E programs to establish a successful campaign of the order of Click-It and Ticket and Booze It and Loose It. .</p>

Potential Difficulties	<p>Development and passage of necessary enabling Legislation. Preventing the mis and over use of the device without first utilizing other treatments and without basing application on thorough engineering study. Funding and Resources for New Installations and continuing Maintenance of Additional locations can be an issue as traditional agreements with vendors have presented the appearance of being a cash cow for the vendor and a wash for the community and safety efforts.</p> <p>Consistent application and extremely high operational efficiency and maintenance are critical for maximum effectiveness.</p> <p>Blind reliance and proprietary dependence on the Technology Vendor.</p>
Appropriate Measures and Data	<p>With regard to the most well known automated enforcement technology – Red Light Cameras – (probably should have been called (Signal Safety Cameras) - Signalized Intersections experiencing primarily angle crashes from vehicles on different approaches (indicating a r/w violation by one of the vehicles) and intersections experiencing chronic red light violations and near misses – and that have employed a full battery of other countermeasures in an effort to improve safety, improve respect, and to enforce compliance. Locations with higher severity of injuries, higher speeds and limited law enforcement coverage could be considered as strong candidates for pursuit of this technology after other measures have been attempted and determined to be in-effective.</p> <p>FHWA Red Light Running: http://safety.fhwa.dot.gov/intersections/col_redlight.htm</p> <p>Safety Evaluation of Red Light Cameras: http://www.tfhr.gov/safety/pubs/05049/</p>
Associated Needs	<p>Statutory Authority (Enabling legislation)</p> <p>Resources to design, construct, manage, operate, maintain and evaluate</p> <p>Technology Specifications</p> <p>Formal Evaluation Process and Procedures for all Automated Enforcement Locations</p> <p>TEPPL Practice</p> <p>NC Supplement</p> <p>Recommended Guidelines and Checklist of Alternative Treatments Utilized</p>
Organizational, Institutional, and Policy Issues	<p>Primarily Internal Policy/Practice Issue. Can be effectively implemented through Operations and Traffic Engineering. Guidance for site selection and application will be critical as intent is not global installations but rather selective installations based on engineering recommendation and previous failed trial of other countermeasures.</p>
Issues Affecting Implementation Time	<p>Implementation time can be largely dependent upon Department Emphasis, Legal Authority, and Available Dedicated Resources. There may also be technical and compatibility issues with proposed hardware, designs, and software, and with existing equipment, utilities, third parties, and ITS devices. Most likely the most time consuming and difficult part of this initiative would be the drafting, sponsoring, and enactment of the enabling legislation. Properly written and executed the delivery of the countermeasures is very achievable and technically straightforward.</p>
Costs	<p>Since basis for application would be the demonstrated existing need and failed trial of other countermeasures, the use of electronic supplemental enforcement mechanisms (countermeasures) would almost entirely be on a retro-fit basis. Retro fit costs can be expected to vary greatly with regard to communications, compatibility, constructability, and maintainability. For planning purposes an additional up front equipment and initial installation cost of \$40,000.00 (VALIDATE) per intersection could be utilized – with appropriate disclaimers on right-of-way, utility, and other possible issues. From a system</p>

perspective administration, management, operational, and maintenance costs should also be factored into life cycle analysis. Additional costs could be associated with collection and evaluation of “Before and After” data in order to document actual cost benefits derived from the new practice.

Training	Establishment and Demonstration of Criteria and Procedures for Candidate Locations. Development of Official TEPPL Practice and subsequent distribution through Executive Committee, Traffic Engineering Roundtables, and TEPPL Web Site, and Other Opportunities such as Operations Staff Meetings and Traffic Engineering and Traffic Services Conference in 2006. Some outreach could be beneficial through public service type announcements and inclusion into sign guides for driver manuals and examinations.
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Legislative Needs	Major Enabling Statewide Legislation and Administrative Rules (Ideally, Landmark legislation would provide enabling authority for a variety of automated/ITS/supplemental enforcement and condition monitoring countermeasures to improve safety and security.
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